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Research Article

Daily Routine: Associations With Health Status and Urgent Health Care Utilization Among Older Adults

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Abstract

Background and Objectives: Chronically ill older adults must integrate self-care behaviors into their daily routine to promote health and reduce urgent health care utilization. Individuals of lower socioeconomic position (SEP) experience a disproportionate burden of stressors that challenge the formation of regular routines. We examined associations between the presence of a daily routine and older adults' health status and urgent health care utilization, to determine whether higher levels of daily routine mediates associations between SEP and health outcomes.
Research Design and Methods: We used data from a cohort of older adult primary care patients in Chicago. Daily routine was measured using a brief, validated scale. A single factor score of SEP was created with measures of education, income, homeownership, and insurance status. Health status was assessed by Patient Reported Outcomes Measurement Information Service physical function, depression, and anxiety. Urgent health care utilization was patient reported. Multivariable models were used to assess the effect of routine and SEP on health status and urgent health care utilization.
Results: Individuals reporting low levels of daily routine reported worse physical function (β = –2.34; 95% CI –4.18, –0.50), more anxiety (β = 2.73; 95% CI 0.68, 4.78) and depressive symptoms (β = 2.83; 95% CI 0.94, 4.74) than those with greater daily routine. No differences in urgent health care utilization were observed by daily routine. Daily routine varied by SEP ($p < .001$); routine partially mediated the relationship between SEP and physical function and anxiety symptoms (ps < .05).
Discussion and Implications: A daily routine may be an under recognized modifiable factor that could promote health outcomes among older adults.

Keywords: Chronic illness, Health, Analysis—regression models, Socioeconomic position

Many people have established patterns of waking, eating, sleeping, and organizing their time; this is often done in the form of a routine to provide a sense of coherence and predictability to one's day (Blaustein & Kinniburgh, 2010; Zisberg, Young, Schepp, & Zysberg, 2007). Adults with chronic illness must engage in a range of self-management

behaviors every day, which requires the incorporation of these activities into one's daily routine. Individuals may be knowledgeable and capable of managing their conditions, but if they are unable to establish a pattern of organizing these behaviors, they may be less likely to sustain them. The salience of adhering to a consistent self-care schedule has frequently been described by chronically ill adults as a primary facilitating mechanism to adopt and maintain these behaviors (Audulv, Asplund, & Norbergh, 2012; Cohn et al., 2012; O'Conor et al., 2017; Tanenbaum et al., 2015).

Although the importance of a daily routine has repeatedly been described by patients, few studies have assessed the degree to which individuals have established daily patterns, and the extent to which having a routine affects engagement in regular self-care behaviors, which in turn may slow the progression of chronic illness, preserve health status, and reduce the need to seek urgent health care utilization (Grey, Schulman-Green, Knafl, & Reynolds, 2015; Zisberg et al., 2007). In one study where this was examined, integrating medication-taking behaviors into one's daily routine was associated with greater medication adherence among a sample of older adults with asthma (Brooks et al., 2014). This association remained when controlling for illness and medication beliefs, depression, anxiety, and health literacy (Brooks et al., 2014). A similar body of literature has examined the role that life chaos can exert on engagement in self-management behaviors. Greater life chaos, defined as variability in daily routine, inability to plan and anticipate the future, and lack of punctuality, was associated with worse medication adherence among patients with HIV and a history of myocardial infarction (Crowley et al., 2015; Kalichman & Kalichman, 2016; Zullig et al., 2013). A single study among patients with HIV has extended the analyses to distal outcomes including health status and emergency department (ED) visits and only observed associations with mental health outcomes (Wong, Sarkisian, Davis, Kinsler, & Cunningham, 2007).

Social and economic hardship make it difficult to engage in a consistent daily routine. Adults who are exposed to significant stressors such as financial insecurity, housing and employment instability, violence, and trauma often contend with lives marked by extraordinary unpredictability (Desmond, 2012, 2016; Evans, Gonnella, Marcynyszyn, Gentile, & Salpekar, 2005). The pressing nature of these stressors results in their prioritization and, as a result, the postponement of planned activities. Individuals of lower socioeconomic position (SEP) are disproportionally exposed to theses stressors due to the social stratification of power, prestige, and access to resources (Solar & Irwin, 2010), and the resulting unpredictability within their lives may challenge the formation of regular daily routines. Therefore, this lack of daily routine may be a contributing factor in the long-standing pathway through which SEP produces poor health outcomes. Literature exploring the role of life chaos on health outcomes has examined whether life chaos acts as a mediator between poverty and self-management behaviors, but has found inconsistent results (Kalichman & Kalichman, 2016; Wong et al., 2007).

Considered together, the development of a daily routine may be an overlooked, potentially modifiable social determinant of health that might explain disparities in health outcomes and urgent health care utilization. The objectives of this study were to examine associations between the presence of a daily routine and older adults' health status and urgent health care utilization, and determine whether a higher level of daily routine mediates associations between SEP and health outcomes. It was hypothesized that older adults with greater daily routine would have better health status and less urgent health care utilization, and that daily routine would mediate the associations between SEP and these outcomes.

Materials and Methods

Participants and Procedures

We conducted a secondary data analysis using cross-sectional data from a National Institute of Aging cohort study entitled "Health Literacy and Cognitive Function among Older Adults" (referred to as "LitCog"). LitCog is a prospective cohort study investigating changes in health literacy over time and its relation to cognitive function and performance on health care tasks (Wolf et al., 2012). A total of 900 patients were recruited from one academic general internal medicine practice and six federally qualified health centers in Chicago, Illinois, between August 2008 and August 2015. English speaking adults who sought regular care (defined as two clinic visits within the past 2 years) from study sites were identified through practice records, and research coordinators contacted potential participants by telephone to screen for eligibility. Patients were eligible if they (a) were between the ages 55 and 74, (b) spoke English, and (c) had adequate cognitive capacity, as defined by ≤2 errors on the 6-item screener (Callahan, Unverzagt, Hui, Perkins, & Hendrie, 2002). Participants were invited to participate in follow-up interviews every 3 years. In the current study, cross-sectional data from the third time point were used, with a total of 470 completed individual interviews. Among those who did not participate, 74 were not yet eligible for the third time point interview, 30 were pending interview completion, 55 were deceased or no longer community dwelling, 31 moved away, 179 declined participation, and 61 were unable to be contacted. Among those due to complete the third time point interview, those who did not participate were more likely to be male, older, identified as black, have less income, educational attainment, and more chronic conditions at baseline (ps < .05). The study was approved by the institutional review board at Northwestern University Feinberg School of Medicine, Chicago, Illinois.

Measurement

Independent Variables

Daily routine

Daily routine was assessed by the routine subscale of the Martin and Park Environmental Demands (MPED) Questionnaire. The MPED is a brief instrument that was developed to evaluate self-reported environmental demands in the form of daily busyness and routine within an individual's daily life (Martin & Park, 2003). The daily routine subscale includes four items that measure the frequency that an individual perceives following a regular routine in his or her behaviors every day. These items capture the frequency someone engages in daily activities at the same time, including getting up in the morning and going to bed in the evening, eating meals, and engaging in activities at home; the final item asks participants to describe how often their days follows a basic routine. Each item is rated on a 5-point Likert scale with responses ranging from never to always. Scores range from 4 to 20, with higher scores indicating greater daily routine. Tertiles were also calculated (low, moderate, and high) as we hypothesized that the distribution of daily routine would be similar to SEP. The scale demonstrated good reliability among our sample (α = .68).

Socioeconomic position

The National Academy of Medicine report "Accounting for Social Risk Factors in Medicare Payment" identified income, education, dual Medicare and Medicaid eligibility, and wealth as indicators of SEP among older adults.(National Academies of Sciences, Engineering, and Medicine, 2017) In our study, annual household income (<$10,000, $10,000–$24,999, $25,000–$49,000, and >$50,000), and education (less than high school, high school graduate, some college, college graduate, and graduate degree) were self-reported. Our sample included adults between the ages 60 and 82, and as a result not all participants were eligible for Medicare. We expanded the potential health insurance categories beyond dual-eligibility status to reflect our population (Medicaid or Medicaid + Medicare, Medicare, Private or Medicare + Private) in order to accurately reflect available health-related resources (Armenia, Pentakota, & Merchant, 2017; Bittoni, Wexler, Spees, Clinton, & Taylor, 2015; National Academies of Sciences Engineering and Medicine, 2017). Finally, a measure of wealth was assessed by homeownership status (own, rent), as homeownership is one of the primary mechanisms with which wealth is created within the United States (Shapiro, Meschede, & Osoro, 2013).

An exploratory principal component analysis using orthogonal rotation was conducted with the four SEP variables to identify the number of factors, yielding a single factor (Eigen: 2.70, factor loadings range: 0.79–0.89, 68% of variance accounted for). A single factor score was created using maximum likelihood methods to represent SEP, taking into account the four distinct, but related components. To categorize SEP scores, tertiles were calculated (low, moderate, and high). Tertiles were used due to the well-documented gradient effect of SEP on health outcomes (Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010).

Outcomes

Functional health status and urgent health care utilization were the outcomes assessed for these analyses. Functional health status is commonly measured by assessments of physical functioning and mental health status (Cella et al., 2010; McDowell, 2006). Physical functioning measures provide indications of the severity of chronic illnesses across a general population (McDowell, 2006), and mental health assessments provide indications of emotional well-being and are often measured in the form of depressive and anxiety symptoms (Cella et al., 2010).

Functional health status

Functional health status was assessed using Patient Reported Outcomes Measurement Information Service (PROMIS) short-form instruments of physical function, depression, and anxiety (Cella et al., 2010). PROMIS measures were developed for use among a general population of adults and adults with chronic illness. The short-form instruments ask questions that are universal in nature, rather than condition specific. Physical function was measured using the 10-item short-form physical function scale, which assesses an individual's ability to carry out a range of activities that require physical capability, from activities of daily living to more vigorous activities such as climbing stairs. Depressive and anxiety symptoms were measured with the coinciding 8-item short-form PROMIS scales, which include items on negative mood, decrease in positive affect, and negative views of self. Anxiety symptoms were assessed with the 8-item short-form anxiety scale, which includes aspects of fear, worry, dread, and hyperarousal. A raw score was calculated for each of the three scales with high scores indicating greater ability or more symptoms. Raw scores were translated into a corresponding *t* score, which rescales the raw score into a standardized score with a mean of 50 and standard deviation (*SD*) of 10 (Cella et al., 2010).

Health care utilization

Urgent health care utilization was assessed by self-report of ED visits and inpatient hospitalizations. During the interviews, patients were asked to self-report if they (a) visited the ED in the past 12 months, and (b) were hospitalized in the past 12 months. Questions were phrased to incorporate the boundary of the past 12 months (e.g., since last May 1) to aid patient recall. Patients also reported the purpose and approximate month and year of their visit. Due to the large number of ED and hospital facilities within the Chicago area, self-report was considered the most accurate method to obtain these outcomes. Any reported ED visits that resulted in inpatient stays were counted only as an inpatient hospitalization.

Covariates

During the interview, age (60–65, 66–74, and 75+), gender, race (white, black, and other), and number of chronic conditions were self-reported. Chronic conditions that were assessed included arthritis, asthma, cancer, chronic obstructive pulmonary disease, congestive heart failure, coronary vascular disease, depression, diabetes, hypertension, hypocholesteremia, and stroke. These data were categorized as 0–1, 2, or 3 or more chronic conditions.

Analysis Plan

First, differences between participant characteristics and daily routine score (measured continuously) were analyzed using analysis of variance (ANOVA). ANOVA was then used to examine differences in health status (physical function, depressive symptoms, and anxiety symptoms) by level of daily routine (low, moderate, and high). Post hoc comparisons using the Tukey honest significant difference test were subsequently conducted. Chi-square tests were used to examine differences in urgent health care utilization (ED visits, hospitalization) by the three levels of daily routine. Linear and logistic regression models were conducted to identify the association of daily routine with each health status and urgent health care utilization outcome while controlling for SEP, age, gender, and number of chronic conditions.

To investigate whether the presence of a daily routine mediated associations between SEP and health outcomes, a series of linear and logistic regression models were conducted, following methods presented by Baron and Kenny (1986) and Iacobucci (2012), to accommodate categorical variables (Baron & Kenny, 1986; Iacobucci, 2012). The independent variable, SEP (low, moderate, and high), was an ordinal variable and the highest tertile was classified as the referent value. Daily routine was the mediating variable and was measured continuously. All multivariable models were adjusted for age, gender, and number of chronic conditions. First, the direct path between SEP and each of the five outcomes were tested with linear and logistic models. Second, the association between SEP and daily routine was assessed using linear regression. Finally, mediation by daily routine was examined in models using tertiles of SEP to predict health status and urgent health care utilization. As SEP is ordinal, mediation was tested using regression parameters from the lowest tertile relative to the highest (referent) following methods presented by Iacobucci to calculate the $z_{(mediation)}$ score. The percentage attenuation was subsequently calculated for models in which daily routine was found to be a significant mediator. All statistical analyses were performed using STATA 13.1 (College Station, TX).

Results

A total of 461 participants had complete data and were included in these analyses. The mean age of participants was 69 years (*SD* 5.3; range 60–82 years). Participants were mostly female (71.2%), self-identified as white (52.7%) or black (37.5%), and were living with three or more chronic conditions (59.0%; Table 1). There was socioeconomic variation, a third (31.5%) reported annual household incomes <$25,000, and 20% reported incomes between $25,000 and $49,999; the majority of the sample had a high school (34.1%) or college degree (56.1%), and owned their home (61.2%). A total of 17.4% had Medicaid insurance (either as their sole form, or in combination with Medicare), 25.2% had only Medicare, and the majority (57%) had some form of private insurance (either as their sole form, or in combination with Medicare). The average physical function, depression, and anxiety scores were 47.5 (*SD* = 9.1), 51.1 (*SD* = 8.8), and 46.1 (*SD* = 8.2),

Table 1. Participant Characteristics and Daily Routine (*n* = 461)

Characteristic	*n* (%)	Routine Mean (*SD*)	*p* value
Age (years)			.14
60–64	128 (27.8)	13.0 (2.8)	
65–74	255 (55.3)	13.6 (3.0)	
75+	78 (16.9)	13.8 (3.1)	
Gender			.53
Male	133 (28.9)	13.6 (3.1)	
Female	328 (71.2)	13.4 (3.0)	
Chronic conditions			.05
0–1	90 (19.5)	13.9 (2.7)	
2	99 (21.5)	13.9 (2.7)	
3+	273 (59.0)	13.2 (3.2)	
SEP Tertile			<.001
1 (Low)	156 (33.8)	12.4 (3.3)	
2	165 (35.8)	13.9 (2.9)	
3 (High)	140 (30.4)	14.1 (2.3)	
Education attainment			<.001
Less than high school	45 (9.8)	11.9 (3.9)	
High school graduate	55 (11.9)	12.5 (3.2)	
Some college	102 (22.2)	13.0 (3.2)	
College	91 (19.7)	14.1 (2.5)	
Graduate degree	168 (36.4)	14.1 (2.5)	
Income			<.001
<$10,000	43 (9.3)	11.4 (3.3)	
$10,000–$24,999	102 (22.1)	13.2 (3.2)	
$25,000–$49,999	92 (20.0)	13.3 (3.3)	
>$50,000	224 (48.6)	14.1 (2.5)	
Homeownership			<.001
Rent	179 (38.8)	12.6 (3.5)	
Own	282 (61.2)	14.0 (2.5)	
Insurance status			<.001
Medicaid, dual eligibility	80 (17.4)	12.1 (3.6)	
Medicare	116 (25.2)	13.2 (3.0)	
Private, private + Medicare	265 (57.4)	14.0 (2.7)	

Note: Socioeconomic position (SEP) Tertile is composed of educational attainment, income, homeownership, and insurance status.

respectively, and 19.5% had visited the ED and 16.3% had been hospitalized in the past 12 months (Table 2).

The average daily routine score was 13.5 and ranged from 4 to 20. Variation in mean (*M*) daily routine score by tertile was low daily routine (*M* = 10.1, *SD* = 2.1, range 4–12); moderate daily routine (M = 14.0, SD = 0.8, range 13–15); and high daily routine (*M* = 16.8, SD = 1.2, range 16–20). Daily routine did not vary by age or gender, but individuals diagnosed with three or more chronic conditions reported lower levels of daily routine than those with fewer conditions (*p* = .05). Mean daily routine score varied by SEP levels (*p* < .001), and post hoc tests indicated that the mean score for individuals of low SEP (*M* = 12.4, *SD* = 3.4) was significantly different than those of moderate (*M* = 13.9, *SD* = 2.9) and high (*M* = 14.2, *SD* = 2.3) SEP, but daily routine scores did not differ between individuals of moderate and high SEP.

Patient-reported health outcomes varied by level of daily routine (Table 2). Patient-reported physical function demonstrated a graded relationship with level of daily routine (high: *M* = 50.3 [*SD* = 9.1]; moderate: *M* = 47.8 [*SD* = 8.5], low: *M* = 45.3 [*SD* = 9.0]), with significant post hoc differences between groups (*p*s < .05). Individuals with the lowest level of daily routine reported greater anxiety symptoms (*M* = 52.8, *SD* = 9.0 vs *M* = 49.0, *SD* = 9.1) and depressive symptoms (*M* = 48.3, *SD* = 9.0 vs *M* = 44.2, *SD* = 7.4) than those classified as demonstrating the highest level of daily routine. Similar results were found in adjusted models (Table 3), individuals reporting low and moderate levels of daily routine reported worse physical function scores (low: β = –2.34; 95% CI –4.18, –0.50; moderate: β = –2.07;

95% CI –3.81, –0.34) compared with those with the highest level of daily routine. In addition, those with a low level of daily routine reported greater anxiety symptoms (β = 2.73; 95% CI 0.68, 4.78) and depressive symptoms (β = 2.83; 95% CI 0.94, 4.74) than those with the highest level of daily routine.

In unadjusted analyses, individuals with a low level of daily routine reported greater ED use in the past 12 months, compared to those with moderate level of daily routine (27.7% vs 13.8%, *p* = .005), and no differences were found in hospitalization. Adjusted analyses did not yield any significant differences in urgent health care utilization by level of daily routine.

Mediational Analysis

To investigate whether daily routine functioned as a mediator of the association between SEP and health outcomes, we first tested the association of SEP and each outcome. SEP demonstrated a similar relationship with health outcomes in unadjusted analyses as daily routine, and was also not associated with hospitalization (Table 2). In analyses adjusted for participant characteristics, compared to individuals in the highest SEP, individuals in the lowest SEP had worse physical function (β = –7.33; 95% CI –9.14, –5.52) greater depressive symptoms (β = 2.15; 95% CI 0.28, 4.02), and greater rates of ED use in the past 12 months (odds ratio 3.76; 95% CI 1.86, 7.62). No relationship was found with anxiety symptoms or hospitalization. Subsequently, the association between the independent variable and the mediating variable was confirmed, individuals within the

Table 2. Health Outcomes Across Three Routine and Socioeconomic Status Tertiles (Means With Standard Deviations and Percentages)

| | Routine Tertile | | | |
	Low routine (*n* = 155)	Medium routine (*n* = 181)	High routine (*n* = 125)	Overall *p* value
Health status, mean (*SD*)				
Physical function	45.3 (9.0)	47.8 (8.5)	50.3 (9.1)	<.001
Anxiety	52.8 (8.9)	51.1 (8.3)	49.0 (9.1)	.002
Depression	48.3 (9.0)	45.6 (7.5)	44.2 (7.4)	<.001
Urgent health care utilization, %				
ED	27.7	13.8	17.6	.005
Hospitalization	19.5	16.0	12.8	.32
	SEP Tertile			
	Low SEP (*n* = 156)	Medium SEP (*n* = 165)	High SEP (*n* = 140)	Overall *p* value
Health status, mean (*SD*)				
Physical function	42.2 (7.9)	49.3 (8.8)	51.8 (7.6)	<.001
Anxiety	52.5 (8.8)	50.0 (9.2)	50.9 (8.2)	.04
Depression	48.3 (8.8)	45.0 (8.0)	45.0 (7.2)	<.001
Urgent health care utilization, %				
ED	30.8	18.2	8.6	<.001
Hospitalization	21.2	15.2	12.1	.09

Note: ED = emergency department; SEP = socioeconomic position.

Table 3. Adjusted Regression Estimates for the Associations of Routine and Socioeconomic Position With Health Status and Urgent Health Care Use

Outcome	Model 1, SEP	Model 2, Routine	Model 3, Routine + SEP
Health status	β (95% CI)	β (95% CI)	β (95% CI)
Physical function score			
Routine			
Low		–3.79 (–5.72, –1.87)***	–2.34 (–4.18, –0.50)*
Medium		–2.57 (–4.41, –0.72)**	–2.07 (–3.81, –0.34)*
SEP			
Low	–7.33 (–9.14, –5.52)***		–7.00 (–8.81, –5.14)***
Medium	–1.29 (–3.04, 0.47)		–1.25 (–3.00, 0.50)
Anxiety symptoms			
Routine			
Low		2.78 (0.78, 4.80)**	2.73 (0.68, 4.78)**
Medium		1.73 (–0.19, 3.66)	1.64 (–0.29, 3.58)
SEP			
Low	0.32 (–1.70, 2.33)		–0.17 (–2.21, 1.88)
Medium	–1.17 (–3.11, 0.78)		–1.28 (–3.23, 0.67)
Depressive symptoms			
Routine			
Low		3.22 (1.35, 5.08)**	2.83 (0.94, 4.74)***
Medium		1.17 (–0.62, 2.96)	1.01 (–0.78, 2.79)
SEP			
Low	2.15 (0.28, 4.02)*		1.58 (–0.32, 3.48)
Medium	–0.18 (–1.99, 1.63)		–0.37 (–2.18, 1.43)
Urgent health care use	OR (95% CI)	OR (95% CI)	OR (95% CI)
Emergency department			
Routine			
Low		1.50 (0.83, 2.74)	1.23 (0.67, 2.30)
Medium		0.72 (0.38, 1.36)	0.67 (0.35, 1.29)
SEP			
Low	3.76 (1.86, 7.62)***		3.51 (1.71, 7.18)***
Medium	2.13 (1.02, 4.41)*		1.32 (0.96, 4.18)
Hospitalization			
Routine			
Low		1.55 (0.79, 3.04)	1.42 (0.71, 2.84)
Medium		1.37 (0.70, 2.69)	1.34 (0.68, 2.62)
SEP			
Low	1.50 (0.77, 2.91)		1.42 (0.72, 2.80)
Medium	1.06 (0.54, 2.10)		1.06 (0.53, 2.11)

Notes: All models were adjusted for age, gender, and number of chronic conditions. OR = odds ratio; SEP = socioeconomic position.
*$p < .05$; **$p < .01$; ***$p < .001$.

lowest SEP group reported less daily routine than those of the highest SEP group ($\beta = 1.60$; 95% CI 0.90, 2.29). Finally, daily routine partially mediated the association between SEP and physical function ($z_{routine}$ –2.67, $p = .008$, percentage attenuation: 5%), depressive symptoms ($z_{routine}$ 1.98, $p = .048$, percentage attenuation: 36%), but not ED use ($z_{routine}$ 1.53, $p = .13$).

Discussion

Individuals with chronic illness have repeatedly highlighted the importance of a daily routine in health promotion, but there is a lack of research empirically investigating its role (Zisberg et al., 2007). Related research has examined the impact of life chaos on health status, but was limited to a homogenous sample of low income adults with HIV, and therefore limited in generalizability to a broader population. Consistent with our hypothesis that greater levels of daily routine would be associated with better physical and mental health status, we found that community-dwelling older adults with a high level of daily routine had better patient-reported health outcomes, even after controlling for well-documented predictors including SEP, age, and comorbidity. Among our sample, although the three levels of daily routine demonstrated a graded relationship with physical function, overall it appeared that the lowest level of daily routine was most detrimental, and there were minimal differences in mental health outcomes between the

medium and high levels of daily routine. Individuals classified as having low daily routine responded to the equivalent of sometimes or less across all four questions related to waking, sleeping, eating, and overall general routine. These results indicated that individuals whose daily lives tend to follow a basic routine are more likely to report better health outcomes, and suggests a general framework of routine behaviors, rather than rigid adherence to daily routine, is needed to be beneficial.

Contrary to our hypothesis, we did not observe an association between daily routine and urgent health care utilization. These results are consistent with findings related to life chaos, which also did not observe an association with ED visits (Wong et al., 2007). Urgent health care utilization may be too distal of an outcome, and the presence of a daily routine may have its greatest effect on more proximal outcomes such as health behaviors and health outcomes (Grey et al., 2015). Future research should be targeted earlier in the causal pathway to examine the relationship between a daily routine and self-management behaviors.

Our second hypothesis was that daily routine would mediate the association between SEP and health outcomes, which we did not observe strong evidence in support of. Daily routine only minimally attenuated the relationship between SEP and physical function, which suggests that although individuals of lower SEP had lower levels of daily routine, this only explained a small portion of the relationship with physical functioning. We also found that daily routine mediated the relationship between SEP and depressive symptoms to a greater extent and explained approximately a third of the relationship. Individuals of low SEP are constantly exposed to significant stressors; when stress is overwhelming, depression can be triggered (Hammen, 2005). Addressing all of these stressors in addition to engaging in daily behaviors requires significant cognitive resources. A daily routine may help individuals accomplish daily tasks with minimal cognitive effort, and as a result provide a sense of control and self-efficacy, which in turn may alleviate some depressive symptoms.

In addition to macro-level policy changes that affect social factors such as housing, safety, and food availability, it may be beneficial to target programs and develop tools to provide support on an individual basis to assess an individual's ability to plan for the future, stay organized, and maintain a daily routine (Wong et al., 2007; Zullig et al., 2013). This process could occur with allied health professionals or lay health workers and caregivers who engage in action planning with patients. In action planning, patients take part in a process of implementation intention in which they specify how, where, and when in the future they will complete a desired behavior (Gollwitzer & Sheeran, 2006; Park, Gutchess, Meade, & Stine-Morrow, 2007). During this discussion, a dialogue, coupled with tools, could facilitate the development of a regular daily routine that could be integrated within their ongoing life. This process could be coupled with text message reminders to engage in routine behaviors; similar strategies have been successful in promoting medication-related behaviors (Thakkar et al., 2016), and may be applicable to facilitate other regular behaviors.

Our study should be recognized in the context of several limitations. First, our sample consisted of older adults and may not be generalizable to younger samples. Second, our study design was cross-sectional and we are unable to determine whether greater daily routine leads to improved physical and mental health status, or whether physical and mental health status leads to greater levels of daily routine. It is also plausible that the relationship between daily routine and health status is bidirectional. Future studies should examine routine longitudinally to better understand the direction of the relationship. In addition, although we used a validated measure of daily routine, our measure only included four items, and therefore may not fully capture variations in daily routine. Our measure assessed the regularity of individual behaviors occurring at the same time of day within the home environment and did not encompass regular interpersonal interactions or activities outside of the home, which may be important dimensions (Zisberg et al., 2007). Finally, although we included a composite measure of SEP, we are limited in our measure of wealth. Although homeownership is the primary mechanism adults within the United States build wealth, wealth encompasses an individual's total assets (Braveman et al., 2005).

These findings provide further support behind the strategies individuals with chronic illness have reported engaging in, a regular routine (Audulv et al., 2012; Ludwig, 1997; O'Conor et al., 2017; Tanenbaum et al., 2015), and suggests that a daily routine is associated with improved patient-reported outcomes related to physical and mental health. The development of a daily routine may be of particular importance to individuals of low SEP in seeking to reduce depressive symptoms. In conjunction with work on a macro level to reduce exposure to significant stressors that may interfere in the development of a regular routine, helping people develop and maintain a daily routine could be a part of self-management programs to improve health outcomes.

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Conflict of Interest

None reported.

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